Jetstream 31 (J31) Flight Report for INTEX-B/MILAGRO
Flight VER13 flown 19 Mar 2006

A complete version of this report is posted at
http://www.espo.nasa.gov/intex-b/flightplanningJ31.cgi

Overview
Preflight goals focused on profiling at T2 with the DC-8, flying principal plane legs and spirals near T2 under Aqua, POLDER, and Aura, and flying CAR circles and spirals at T0.
See planned and actual flight tracks in Figures 1 and 2.

Engine on: 1750 UT
Engine off: 2126 UT

Takeoff: 1816 UT
Land: 2122 UT

1951 UT Aqua overpass
~1953 UT POLDER overpass
2007 UT Aura overpass

Cabin crew: Arnold, Livingston (flight scientist), Pommier, Remer, Waquet, Wind

Pilot Summary
Toughest flight to date. Communication fine. Met DC-8 OK at T2, all arrived a few minutes ahead of schedule. DC-8 22 kft, J31 20 kft. Started descent, held at 18 kft for 1.5 full turns. J31 got to 9500 ft. DC-8 intended to go down to 9500 ft. Didn't see DC-8 complete spiral. Visibility poor. Eyes burning in cockpit. Quite turbulent (constant light to moderate) as soon as entering haze layer ~15 kft. CAR stopped working at T2. Transited T2 to T0 at 12,500 ft. T0 had better visibility. Runways had changed direction, so T0 no longer in dead zone. (This only done 10% of year.) Did RSP work at T0. Got down to 9000 ft. Went home past volcano—spectacular.

Discussion of flight
Flight Scientist: Regional haze at VER and to MC had very well defined top: ~4.7 km at T2. Needed to go back up to 16kft to be sure to be above haze. Principal plane run offset to SE of T2, run to SW. AOD max ~0.33. Spiraled up to 16 kft. AOD 0.02. Asked to go to 17 kft. Did RSP run back to start point. 5 traverses total: 3 hi, 1 lo, 1 mid.

Spiraled down to 9000' near T0, 2 nice level runs. AOD 0.22 at 520 nm, 0.17 at 1020 nm.

Instrument Performance & Status

AATS: No problems in flight. After flight attempted measure before & after cleaning window. After cleaning, AATS would not acquire sun. Recovered after ~1 hr of attempts. Should be fine tomorrow [update: tracking on takeoff of 20 Mar flight]. Window looked quite clean.

CAR: Worked great for 8100 scans of data (81 min). Then it stopped. Looks like power problem, probably in instrument. Can't close door now. Probably can't be fixed for tomorrow's flight. Question for tomorrow's flight: fly CAR with cover? [Update: CAR flown 20 Mar with CAR door closed.]

RSP: No problem with acquisition of data, including SWIR channels. Science: Made measurements in principal plane at low alt & hi alt above plume & within plume on same transect, very close to POLDER & Aqua overpass. After landing, LN storage tank empty. Need another source of LN for tomorrow's flight. Did postflight cal. [Update: Found LN for 20 Mar flight, RSP cooling at takeoff.]

SSFR: Worked very well. 2 really good legs at T0. Good legs at T2, except turbulence will require corrections.

POS: Fine during flight. Took extra 10-12 min to get POS program going on laptop.

NavMet: Looks fine.

Flight Path, Timing, and Measurements (all times UT [VER local +6])

Problem w POS laptop—would not open program. Finally did after reboot.
1807 AATS darks.
1810 AATS tracking on ground. AOD(520)=0.25, AOD(1019)=0.096. P=1003.3 mb
1813 POS fine, now taxiing.
Excellent AOD & H2O profile after takeoff. About 50% of AOD(520) below 800 m. AOD ~0.05 at 1.5 km, ~0.011 above 2.4 km. No Ci in sight, only a few cumulus humilis capping haze.
1902 ZGPS 6.524 km, Tstat=-13.1 C, P=457.9 mb.
1919 No Ci, only some scat capping cumulus—looks clear over T2.
1923 Begin spiral descent (Rec ~1145)
1926 ATC stopped our descent at 5.78 km—above haze.
1929 Begin descent again. Top of haze ~4.7 km, need 16 kft for top run
1934 Descending to 9500 ft, very bumpy
1935 Leveling at 9500 ft, heading to SE for principal plane run. AOD~0.21, DC-8 at 15 kft.
1936 to 1941: Principal plane low alt run at 9500 ft, 213 deg heading
1941 Begin ascent
Very flat AOD wavelength dependence at bottom. ~0.33. Tracking error??
1944 AOD(520)=0.024 at 3.6 km
1950 Level at 16 kft
2000 Completed other principal plane run back along same track at 17 kft. Will descend to 12500 ft and perform another level leg.
2007 to 2011: Begin mid-level (12,500') principal plane run.
Proceed to T0 at 12,500 ft.
2018 Much clearer as we approach T0.

2022 In spiral down to 9000 ft; then heading of 320 deg. AOD(520): 0.22, AOD(1020) 0.176.
2023 To 2030: two low level runs at 9000 ft
2030 spiraling up
2034 heading away from MEX to VER—passed just E (?) of MEX airport. Took several pix with Tom's camera--#s 521++
2047 flying back at 6.018 km
2122 Land VER. AOD(520)=0.156; P=999.8 mb
2124 AATS off; POS off.

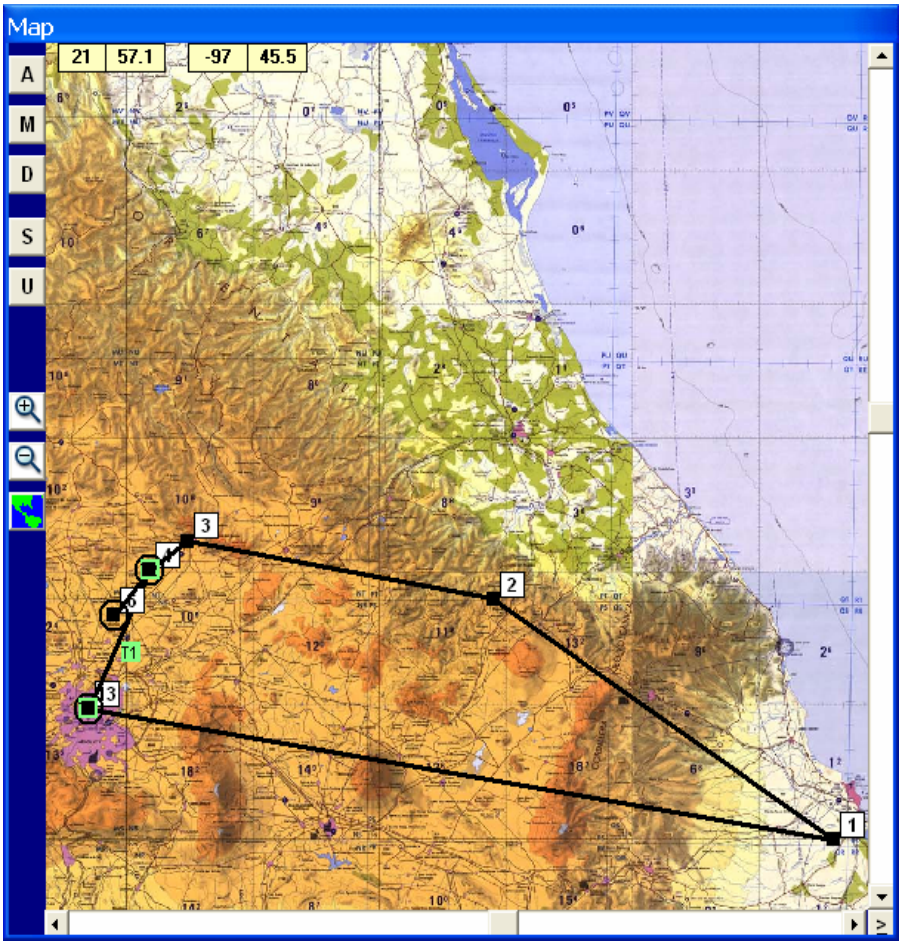

Figure 1. Planned flight track, J31 Flight VER13, 19 March 2006.

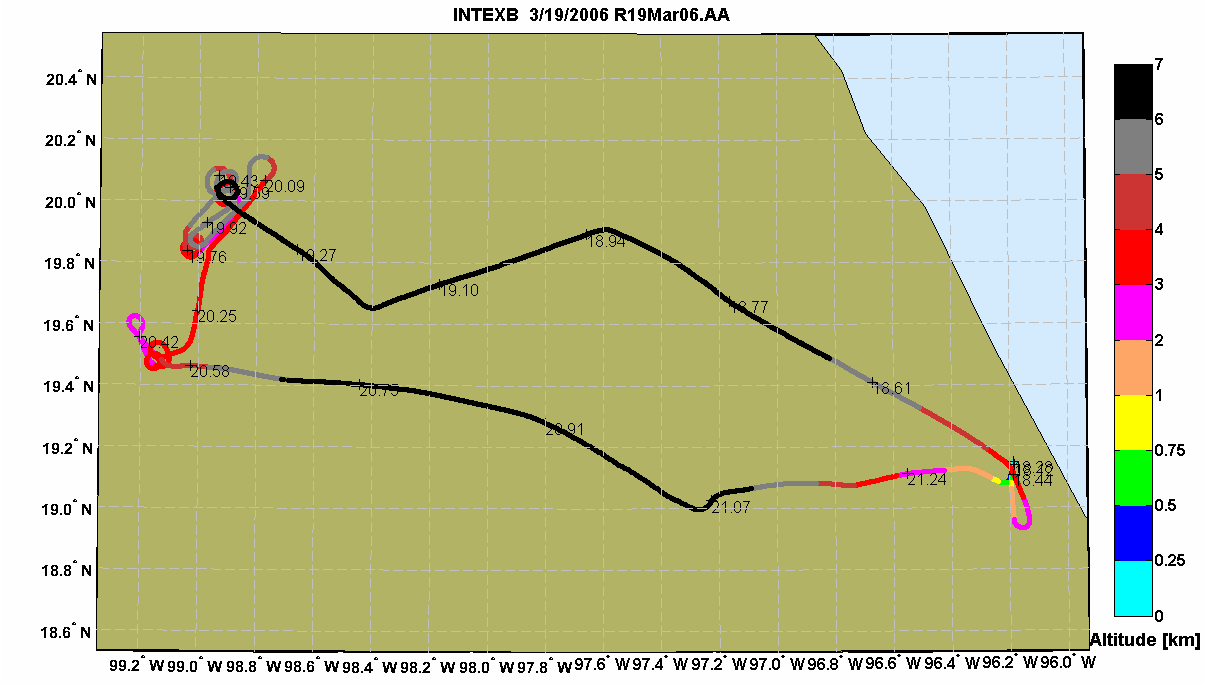

Figure 2. Actual flight track, J31 Flight VER13, flown 19 March 2006.

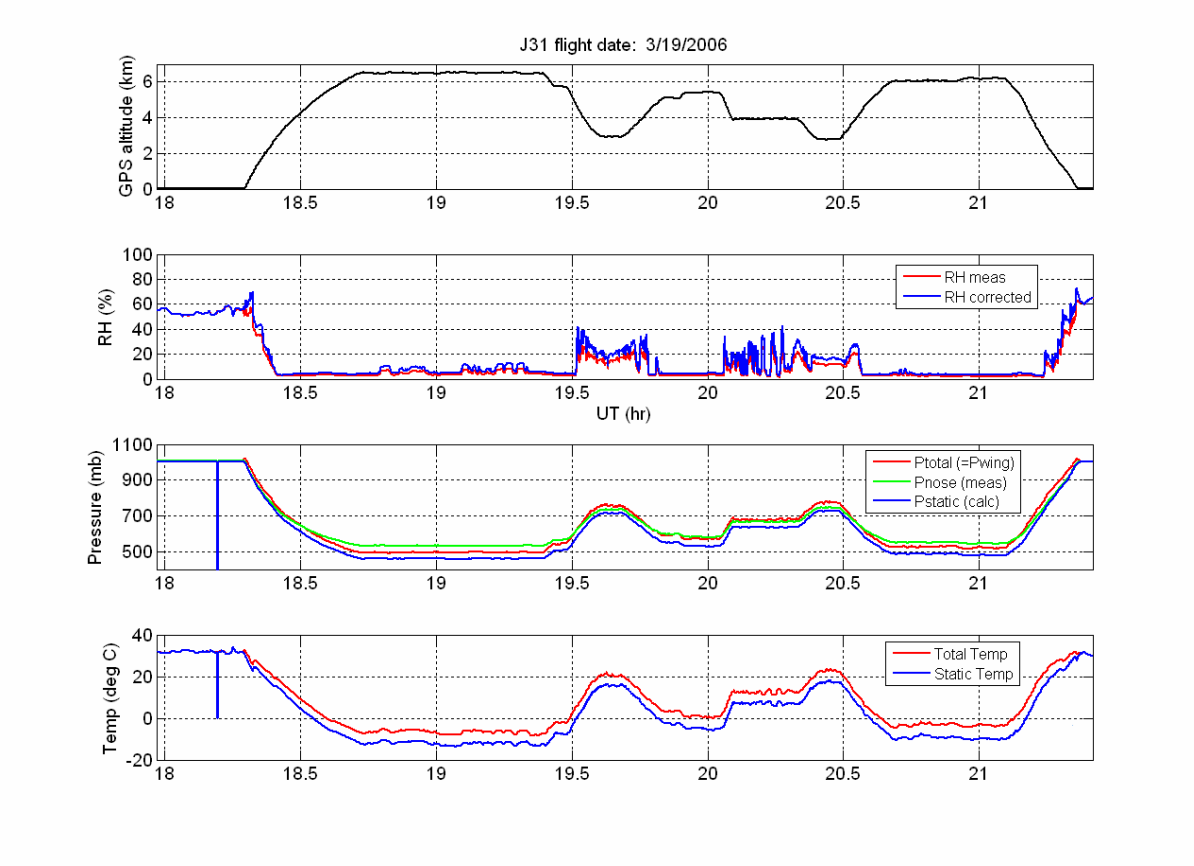

Figure 3. NavMet data, J31 Flight VER13, 19 March 2006.